Metro Water Services Stormwater Program

2008

Today's Topics…

- History of the Stormwater Program
- Responsibilities
- Accomplishments
- Funding Shortage
- Expectations of Study Results

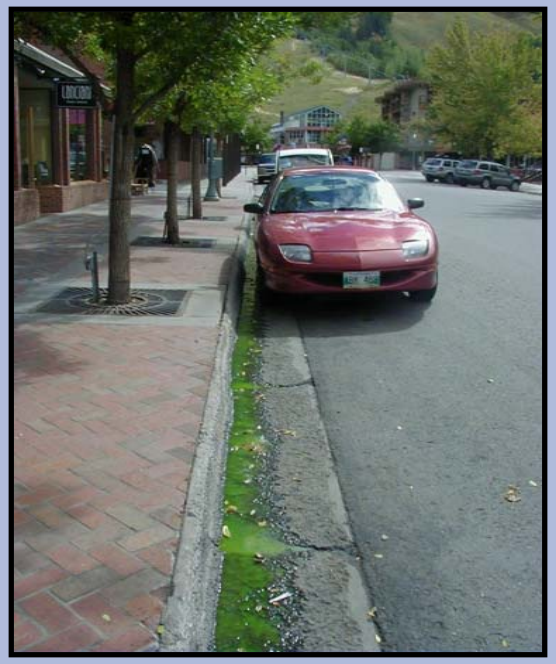
Stormwater Program

Why do we have a Stormwater Program?

1. **Federal Clean Water Act requires it**
   - Unfunded, federally mandated permit
2. **Protect the safety and quality of life of our citizens**
   - Control flooding
   - Reduce pollution
3. **Protect property values and promote the natural beauty and function of our streams**

Stormwater Program

- **Program and costs are driven by rain runoff**
- **Runoff (if not controlled) damages property**
  - Floods private properties
  - Creates unsafe driving conditions
  - Damages infrastructure and ditches
- **Runoff is polluted**
  - Must comply with NPDES permit issued by TDEC and EPA



History of Stormwater Division

1963 – 2002: Stormwater management was the responsibility of Department of Public Works

1996: EPA issues NPDES permit

- Regulates stormwater discharges in Davidson County
- Unfunded mandate for water quality programs

1998 – Stormwater Program Assessment

- Task force initiated by Metro Council
- Defined program inadequacies
- Recommended improvements to Stormwater Program

History of Stormwater Division

2001 – Stormwater Program and Organizational Study

- Updated 1998 assessment
- Investigated operational inefficiencies
- Recommended future program improvements
- **Laid out a 5-year plan**

2002 – Stormwater moves from Public Works to Metro Water Services

- Focused on **operations and organization**
  - ✓Fix neighborhood drainage problems…Now
  - ✓Fix the worst problems first

Stormwater Responsibilities

- **Nashville is 4th largest MS4 system in nation**
  - 473 square miles
  - 546,719 population
  - 9,703 outfalls
- **Metro-owned stormwater system components**
  - Catch basins, area drains, headwalls > **38,000 inlets**
  - Channels > 3,900 miles
  - Pipes > 600 miles
  - Culverts > 100 miles

  4,000 miles of system
  - Detention ponds / BMPs > 3**,000 structures**

Largest MS4s in the United States

Metro Water Services

US EPA MS4 Audit of Stormwater Division

MS4 Permit Compliance

Metro Nashville is One of the Largest MS4 Municipalities

Rank	Municipality	State	Land Area (Square Miles)	Population	MS4 Phase 1
1	Houston (city)	TX	579	2,012,626	X
2	Phoenix (city)	AZ	475	1,418,041	X
3	Jacksonville (city)	FL	758	777,704	X
4	Nashville-Davidson (city-county)	TN	473	546,719	X
5	Oklahoma City (city)	OK	607	528,042	X
6	Anchorage (municipality)	AK	1697	272,687	X
	Butte-Silver Bow (county**)	MT	716	32,393	
	Juneau (city and borough)	AK	2717	31,118	
	Anaconda-Deer Lodge (county**)	MT	737	9,088	
	Sitka (city and borough)	AK	2874	8,849	

Note: Municipality size came from 2002 Census data from the National League of Cities Website
Note: Population came from 2004 Census data

Key Functions

Stormwater Division Includes 5 Sections:

Engineering – reviews plans, serves development community, applies regulations

Water Quality (NPDES) – provides construction site management, protects viability of streams, ensures water quality permit compliance

Master Planning – floodplain management; capital construction projects that alleviate stream flooding, including home buyout

Routine Maintenance – restores function of the existing system through cleaning and stabilizing without major reconstruction

Remedial Maintenance (Minor Construction) – construction to restore function of the existing system and build new systems to resolve flooding concerns

Engineering Services

Engineering – reviews plans, serves development community, applies regulations

- **Write ordinances and regulations**
  - Revised regulations in 2006
- **Review plans for new development**
- **Issue grading permits**

Water Quality Services

Water Quality (NPDES) – provides construction site management, protects viability of streams, ensures water quality permit compliance

- **Metro Government is regulated by US EPA**

Recommendation: TDEC and EPA strongly recommend that MWS devise a dedicated storm water funding source that is more equitable and sustainable in the long term. If this negative trend continues, TDEC and EPA are concern about the ability of MWS to provide adequate finances to implement all the MS4 permit conditions and the SWMP elements as specified in Part III.H of the permit.

- **Noncompliance results in fines**
  - **Columbia, SC** = $800K in fines
  - **Dallas, TX** = $1.2M in fines plus $800K in mandated projects
  - **Chattanooga, TN** = $100K in fines plus $535K in mandated corrective actions

Water Quality Services

Water Quality (NPDES) – provides construction site management, protects viability of streams, ensures water quality permit compliance

Valuable resources and aquatic diversity to protect:

- Nashville Crayfish
- Great Blue Heron Rookery
- Harpeth River is one of TN Scenic Rivers
- Cumberland River is a large, incredible water source

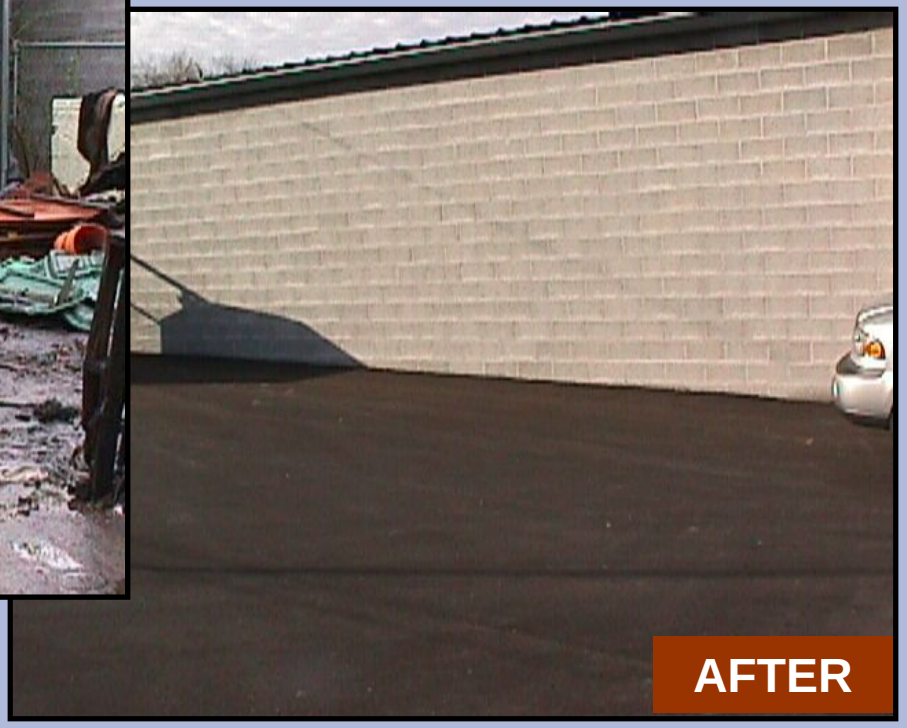
Water Quality Services

Water Quality (NPDES) – provides construction site management, protects viability of streams, ensures water quality permit compliance

- **Stormwater is #1 cause of water pollution in US**
- **53 impaired streams in Davidson County**
- **We must meet TMDLs on these streams**
  - Monitor, identify source of impairment
  - Implement plan to reduce City's impact/impairment to the stream
- **Sediment (siltation) is leading cause for impairment**
  - Other pollutants (metals, bacteria) attach to sediment
  - Sediment impairs the growth, reproduction, respiration, and survival of aquatic life
  - Sediment alters shape, temperature, and habitat of stream

Water Quality Services

Inspect sites for polluted discharges, enforce clean up and compliance



Water Quality Services

Review construction plans, inspect sites, and issue NOVs or SWOs for erosion and sediment-laden discharges

Master Planning – floodplain management; capital construction projects that alleviate stream flooding, including home buyout

2,478 stream miles in Davidson County

Master Planning Services

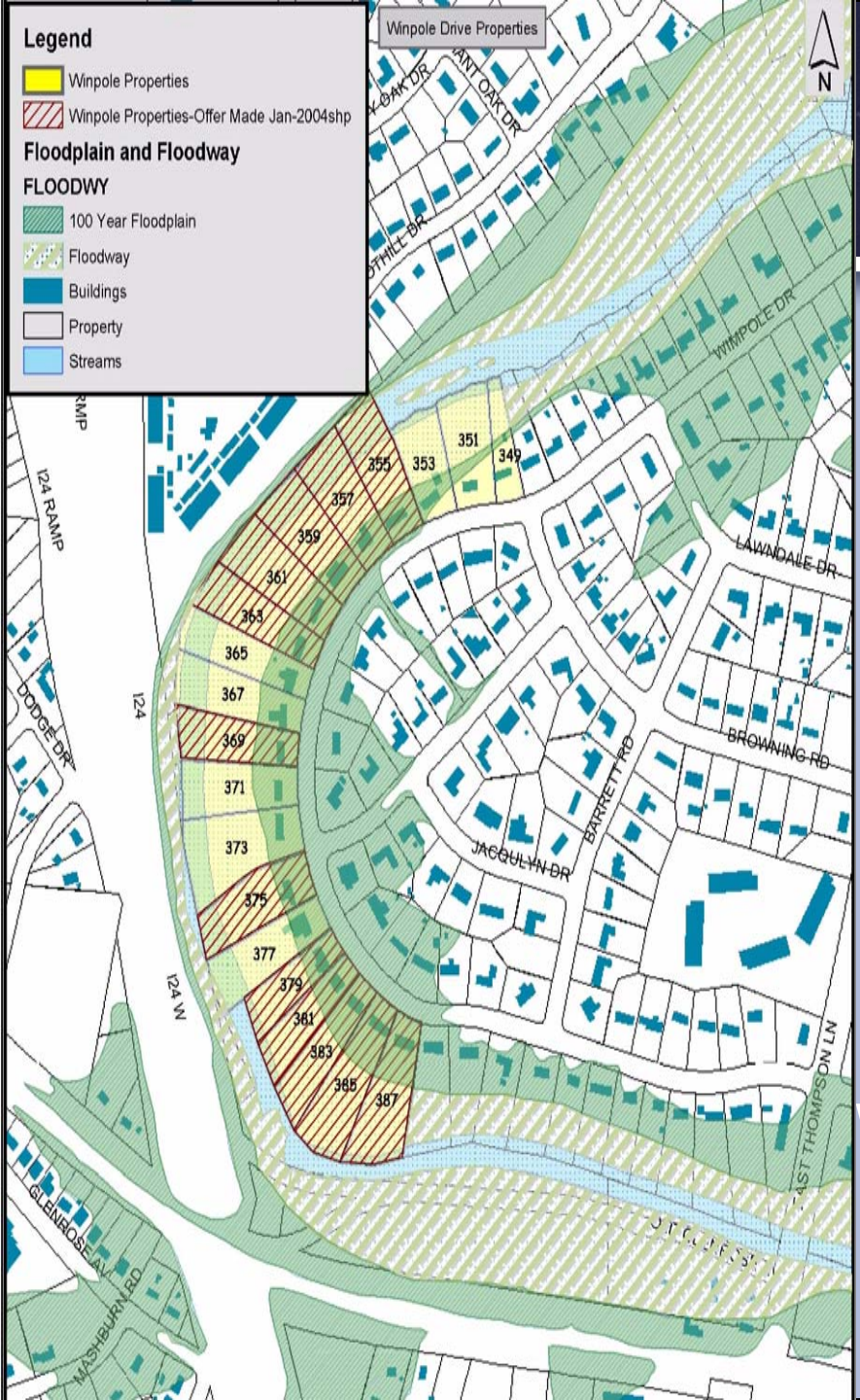
Master Planning – floodplain management; capital construction projects that alleviate stream flooding, including home buyout

FEMA Community Rating System (CRS)

- **10,000 properties in floodplain**
- **3,600 flood insurance policies**
- **10% reduction in flood insurance premiums**

Home Buyout

- **From 1979-2002:** 40 homes removed
- **Since 2002:** 45 homes removed, 38 acres reclaimed and restored for natural flooding area



METRO WATER SERVICES

Wimpole Drive - May 1979

Home Buy Out – Wimpole Drive

Maintenance Services

Service request made to 862-4600

MWS reviews request

Routine Maintenance

Restores function of the existing system through cleaning and stabilizing without major reconstruction

MWS Maintenance Crews

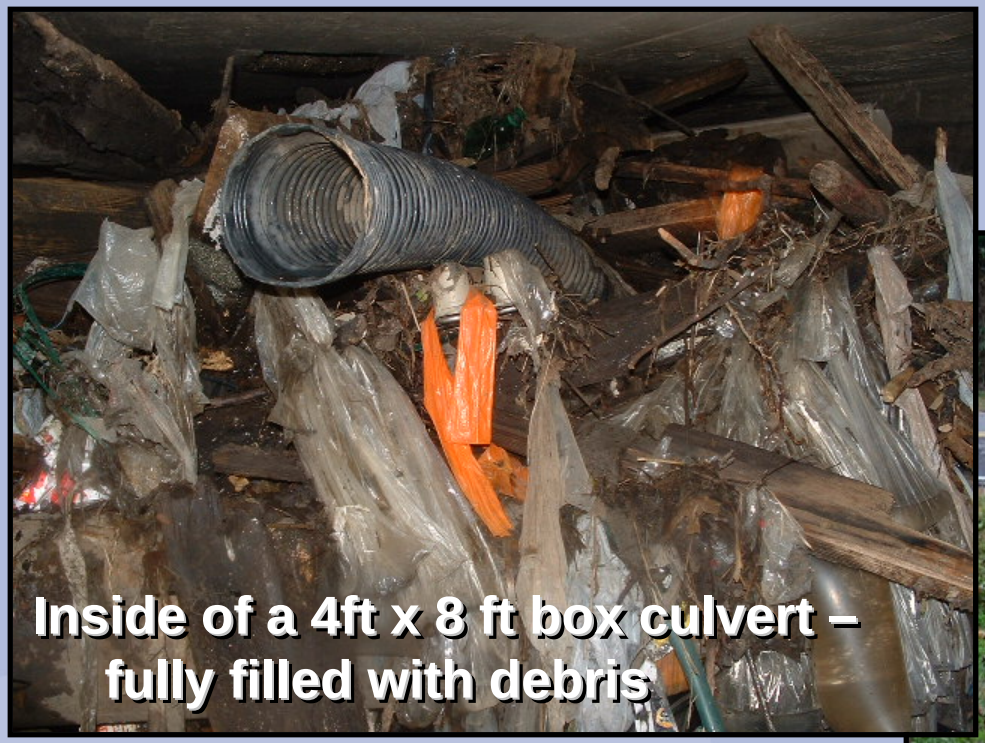
Remedial Maintenance

Construction to restore function of existing system and build new systems to resolve flooding concerns

Private Contractors

Routine Maintenance

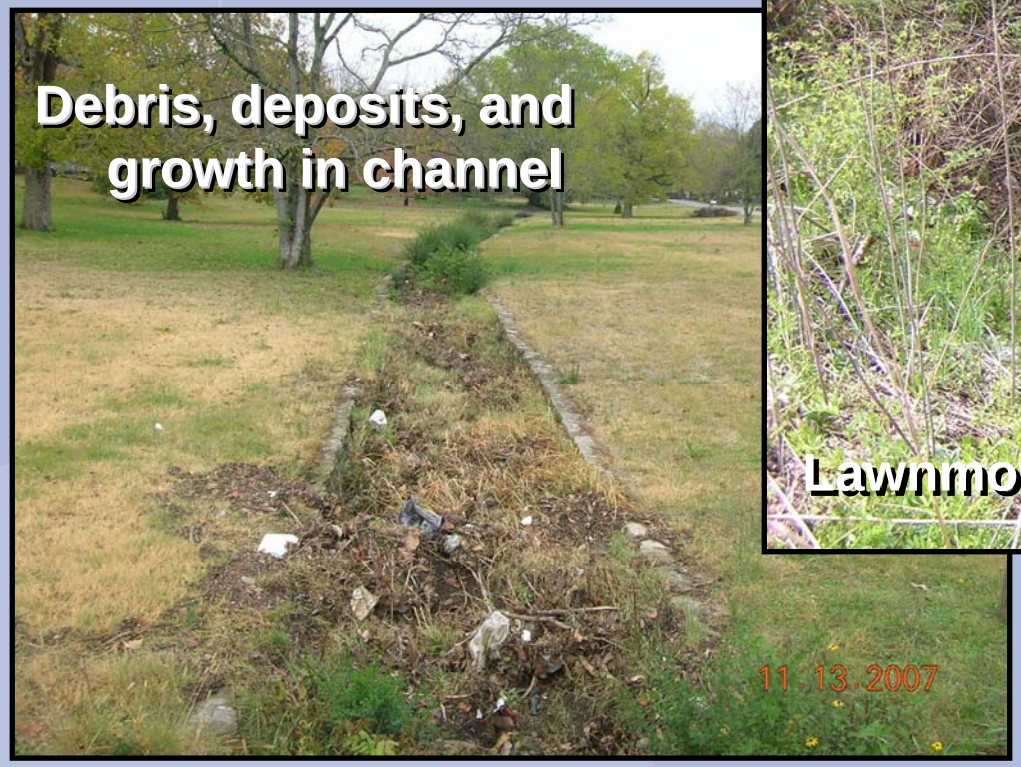
Routine Maintenance - Restores function of the existing system through cleaning and stabilizing without major reconstruction



Inside of a 4ft x 8 ft box culvert – fully filled with debris

Routine Maintenance

Routine Maintenance - Restores function of the existing system through cleaning and stabilizing without major reconstruction



Routine Maintenance

Routine Maintenance - Restores function of the existing system through cleaning and stabilizing without major reconstruction

- **Most demanded and visible stormwater service Metro provides**
- **Over 138,000 inlets cleaned since 2002**
- **Without this work, streets would flood, entire neighborhoods would flood**
- **Over 150,000 jobs completed by MWS crews**
  - Removing debris
  - Repairing ditches, cross drains, driveway pipes, inlets, headwalls, etc.

Maintenance Services

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MWS Maintenance Crews

Remedial Maintenance

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Private Contractors

Remedial Maintenance

Remedial maintenance - Construction to restore function of existing system and build new systems to resolve flooding concerns

- **Remedial maintenance requires planning and design, MINOR CAPITAL PROJECTS**
- **Might include:**
  - culvert replacement
  - headwall replacement
  - replacing damaged, deteriorated, rotted pipes
  - increasing capacities
  - constructing infrastructure where none existed

Remedial Maintenance

Remedial maintenance - Construction to restore function of existing system and build new systems to resolve flooding concerns

Trousdale Road at Hogan Drive

Remedial Maintenance

Remedial maintenance - Construction to restore function of existing system and build new systems to resolve flooding concerns

- **45% of pipes are corrugated metal (CMP)**
  - Lifespan of 5 to 25 yrs
  - Bottoms rust and deteriorate, weakening and sinking
  - Occurs under roads, causing potholes, sometimes complete cave in
  - No longer allowed under roadways, but still a big problem

Remedial Maintenance

Priority Classification	General Example
A	Home Flooding
B	Road Flooding
C	Yard Flooding

Remedial Maintenance

April 2002 – August 2007

	Funded Projects		Not Funded	
Class	Completed	Construction	Designed	Service Request Backlog
A	108	14	31	16
B	107	2	94	289
C	428	11	29	781
Not Classified				788
TOTAL	643	27	154	1874

Designed, Not Funded

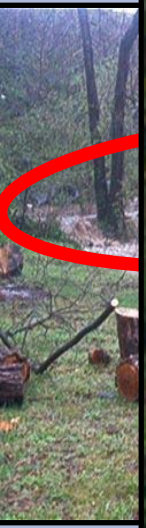
Edge O' Lake Drive - roadways

Designed, Not Funded

Edge O' Lake Drive - backyards

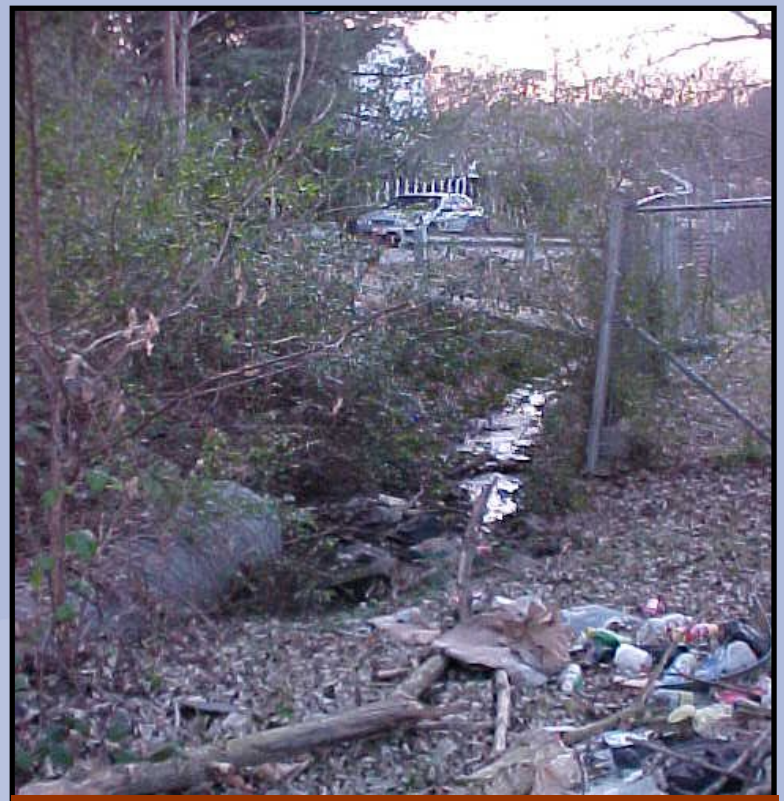
Designed, Not Funded

76



Designed, Not Funded

1519 Boscobel



Ditches and infrastructure need repair

18th Ave Project Under Construction

Nubell Street, Kellow Street, 23rd, Hughes, and 18th

40 acres of drainage, NO infrastructure

18th Ave Project Under Construction

Nubell Street, Kellow Street, 23rd, Hughes, and 18th

Replacing 24 inch pipe, with 4ft x 8ft box

24 inch pipe

4ft x 8ft box

18th Ave Project Under Construction

Nubell Street, Kellow Street, 23rd, Hughes, and 18th

Replacing flooded home/property with detention pond

23rd and Hughes

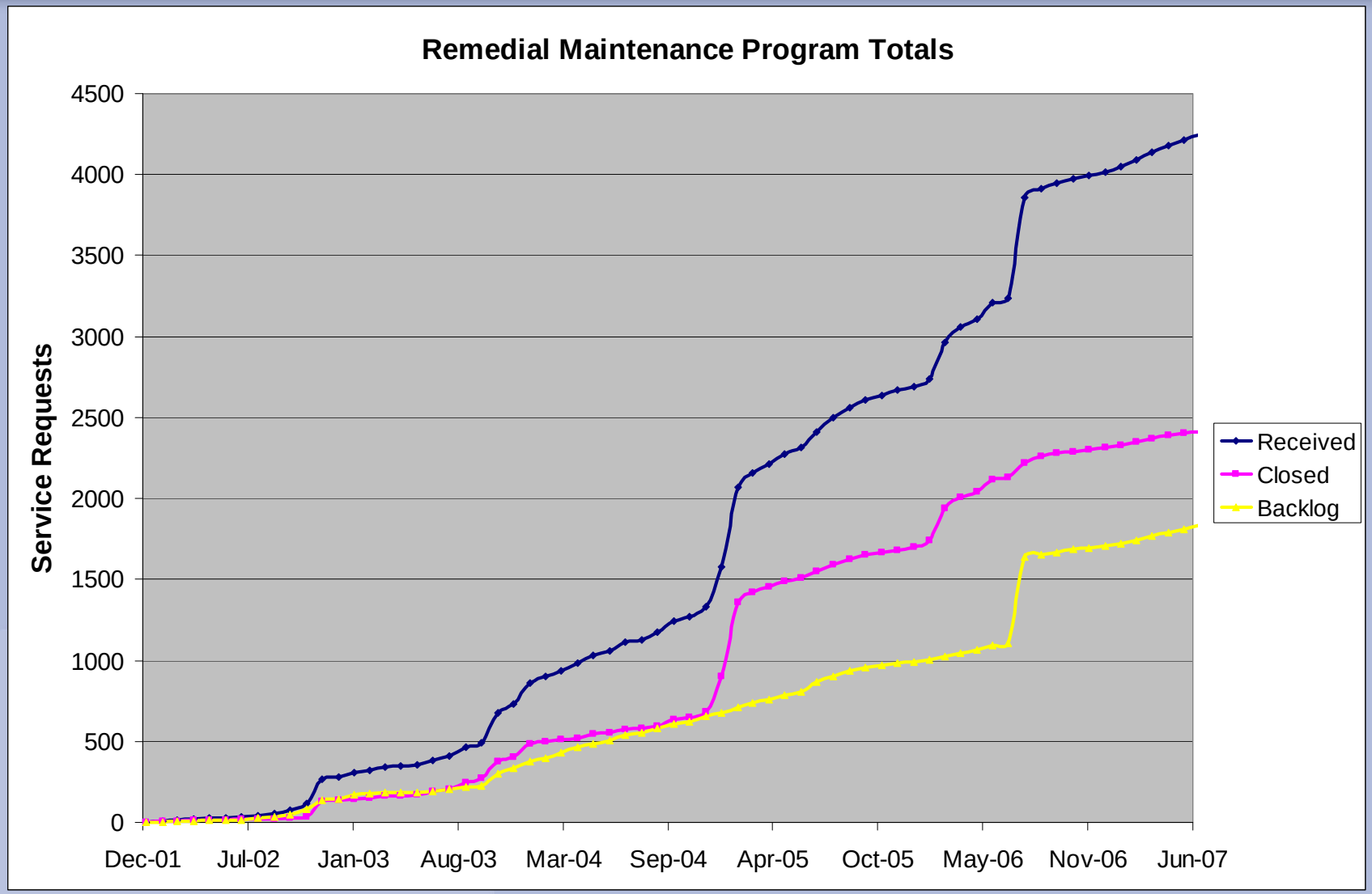
Detention pond

Good progress since 2002

- For the very first time, address problems that had languished for years
- Cleaned or repaired 150,000 structures
- Completed 650 projects to resolve neighborhood flooding
- Satisfied thousands of property owners
- Performed 35,000 inspections
- Revised outdated regulations
- Improved plans review turn around time
- Met Federal unfunded water quality mandates

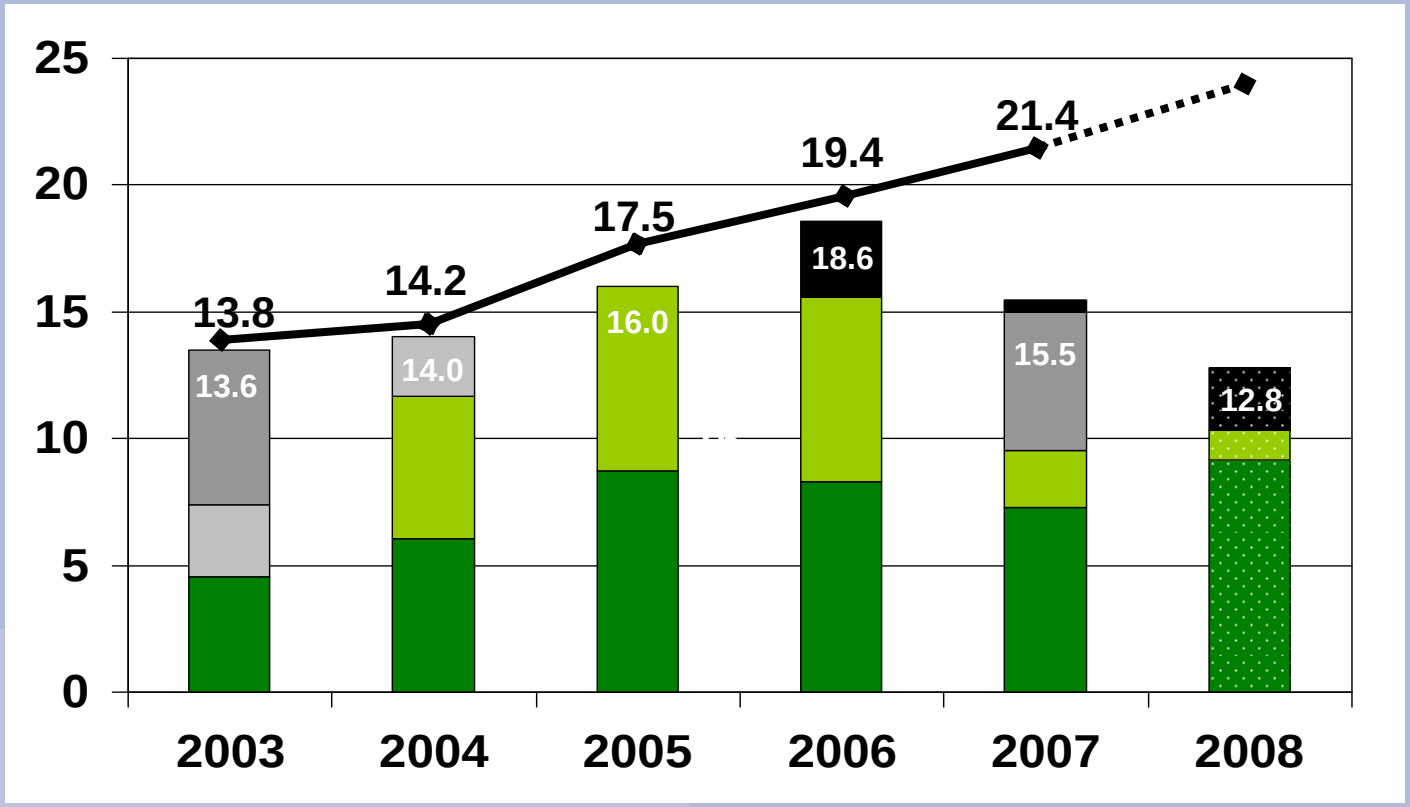
but…

Growing Complaint Backlog



Growing Funding Gap

Actual Program Funding v. Plan (millions)



Growing Funding Gap

- **No direct appropriation from General Fund since 2005**
  - Difficult to choose to fund stormwater over funding education and public safety
  - To fund entirely through General Fund would require 18 cent increase in property tax
  - Property taxes do not fairly reflect a customer's burden/demand on the stormwater system
    - Example: Parking lot (impervious surface) is a larger burden on system than a small residential lot, but pays nothing
- **GO bond support in 2003 and 2007 only**
- **Cannot receive FEMA/TEMA money without a 25% match**

Where we are now…

- **Limited program, lingering problems**
  - Lack of a steady and predictable funding limits ability to pay for and even *plan* for projects
- **Complaint backlog is growing, Nashville is growing**
- **Federally-mandated permit demands are increasing**
  - EPA audit expressed concern with funding and recommended development of stable funding source
- **Stormwater funding is drying up**
- **Reached the end of our 5-year plan**

Consequences of no action….

- **EPA fines**
- **Increased flooding and pollution**
- **Stormwater infrastructure deterioration**
  - Small problems compound to large ones, become more expensive and more damaging
  - Need to protect our investment
- **Reduction in capacity to support development**
- **Decrease in environmental stewardship**
- **Loss of hard-won public confidence and support**
- **Loss of economic interest and appeal**

All of this results in a diminishing quality of life for our citizens.

Long Term Study

- **By unanimous Council vote, MWS is conducting in-depth study to:**
  - Develop the next 5-year business plan
  - Develop a CIP plan
  - Evaluate a user fee as the funding source for the stormwater program
- **Engaging the public**
  - Conducting community meetings across the County
- **Findings of study presented to Council in February 2008**

What is a user fee?

- NOT A TAX
- Like water and sewer fees – based on the use of or demand on the system
- Dedicated revenue tagged for stormwater management only

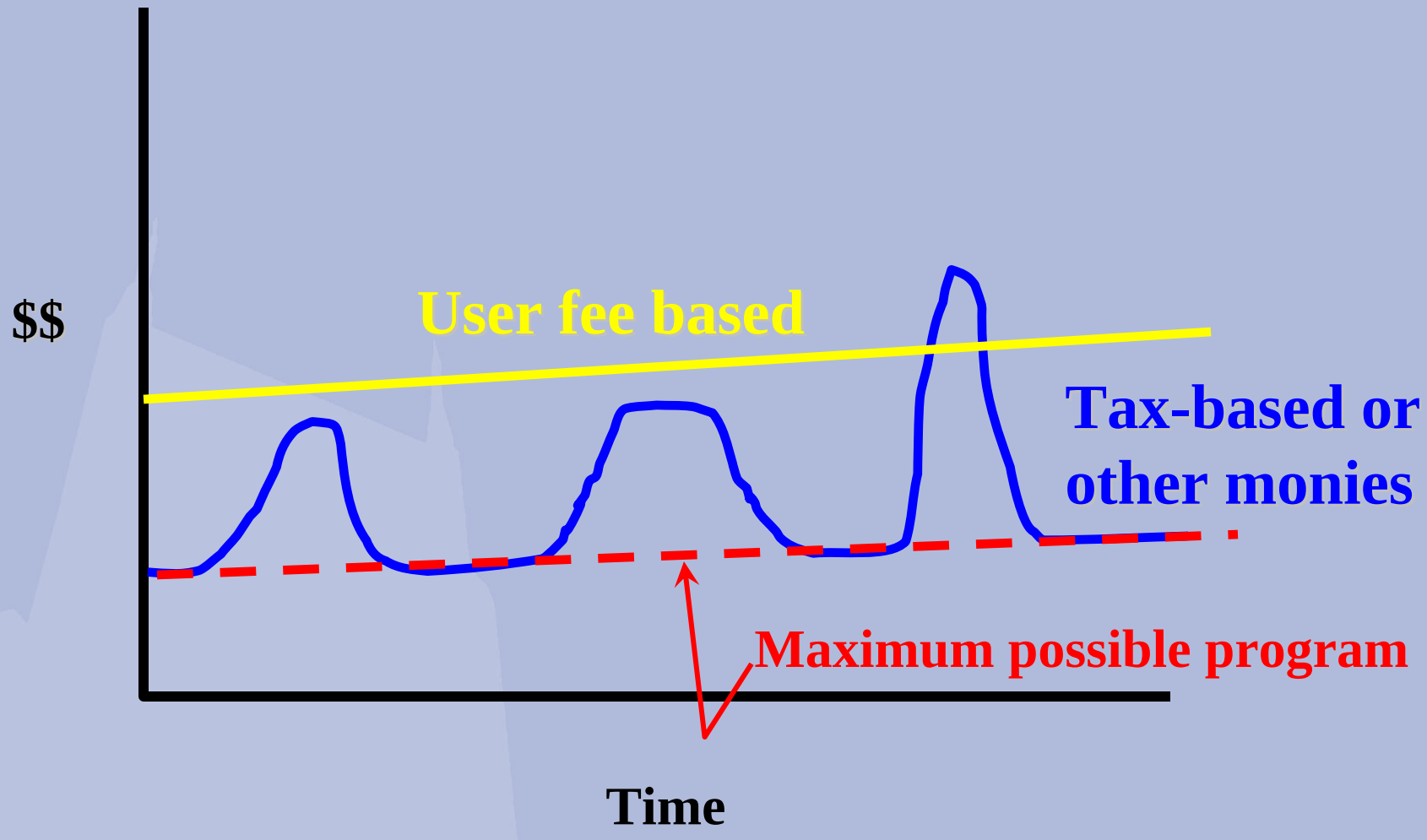
User Fee vs. Tax

Why is a user fee better than a tax?

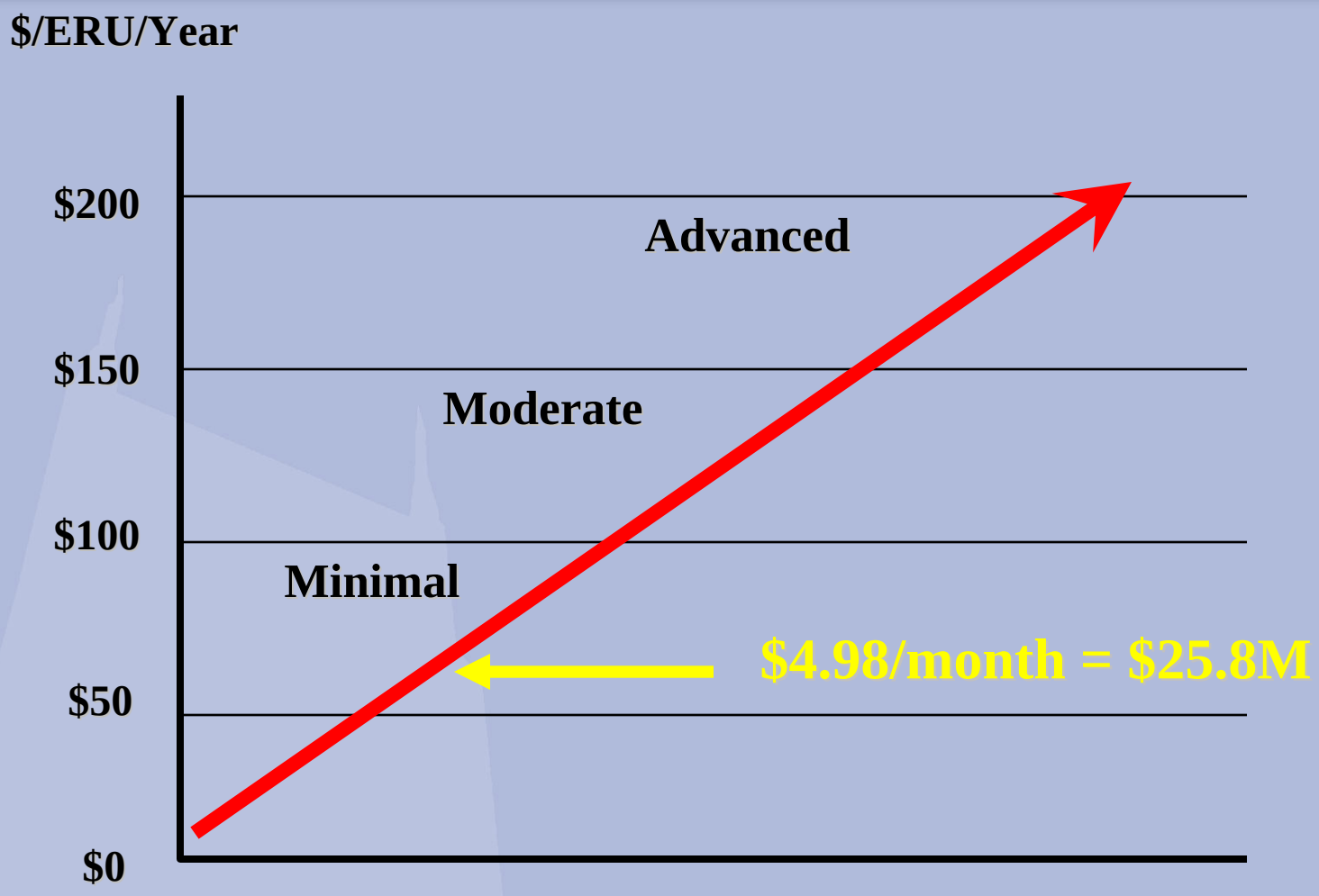
1. **Stable –** not determined by decisions in budget
2. **Adequate –** small fee is sufficient to cover costs of the stormwater program
3. **Flexible –** can be adjusted to reflect property differences, watershed locations, credits and other factors
4. **Equitable –** direct link between fee and impacts to the stormwater system; EVERYBODY pays

Stable

User fee vs. Tax



Adequate


$/ERU/Year
$200
$150
$100
$50
$0
Advanced
Moderate
Minimal
$4.98/month = $25.8M

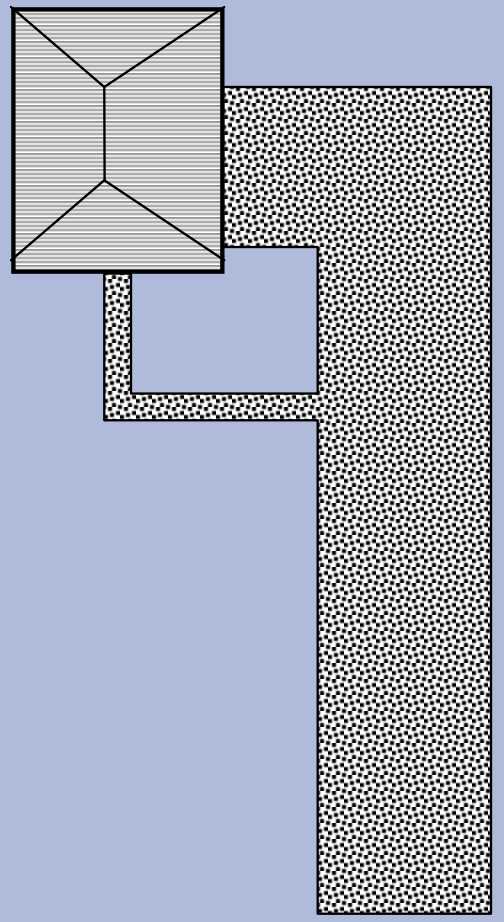
Equitable: User Fee Basis

- **Three main impacts of urban development on stormwater**
  - increases in peak flow
  - increases volume
  - pollution
- **Hard surfaces create runoff and cause these impacts**
- **Hard surfaces require Metro to invest in and maintain the public drainage system**

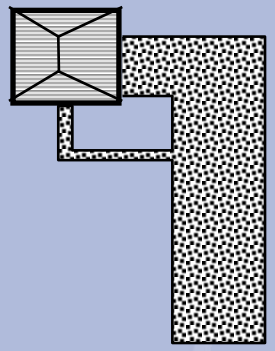
Therefore, hard surface is the basis for the user fee.

How is a fee calculated?

- Impervious surface (hard surface) area (IA) is determined through aerial photography and GIS
- Median hard surface area of single family residence in Nashville is 3200 sq. ft.
- This is an ERU – Equivalent Residential Unit



Residential Tiers

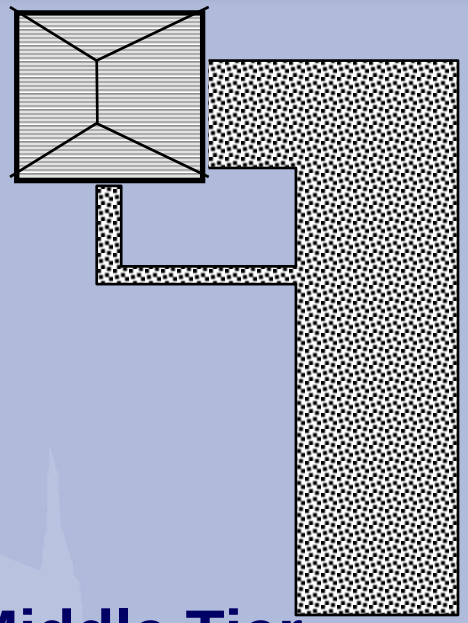


Small Tier

IA < 2000 sq ft

0.5 ERU

$2.49

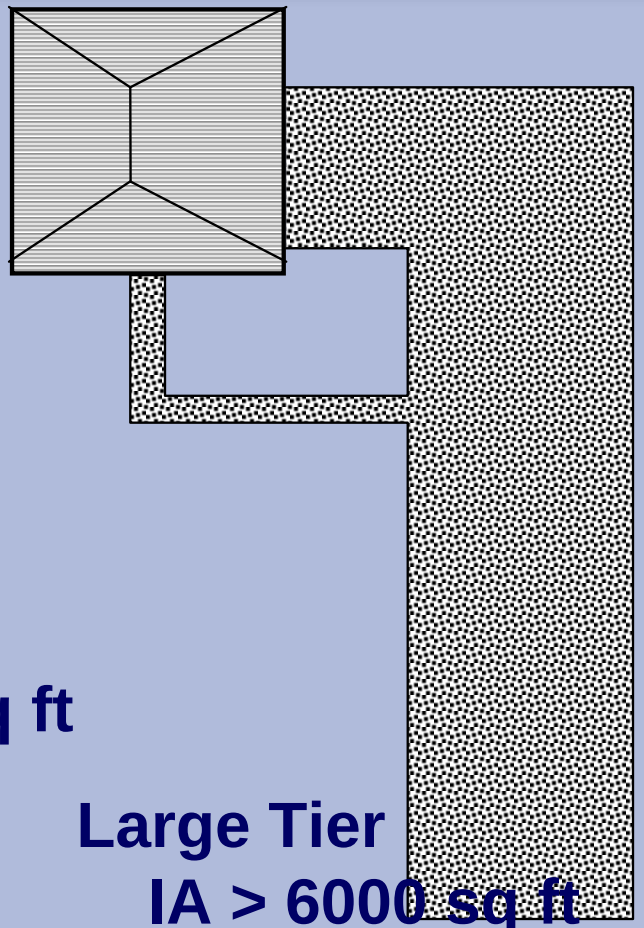


Middle Tier

IA = 2000 – 6000 sq ft

1 ERU

$4.98



Large Tier

IA > 6000 sq ft

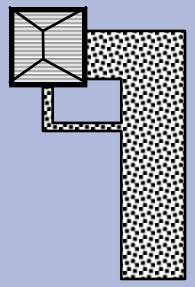
1.5 ERU

$7.47

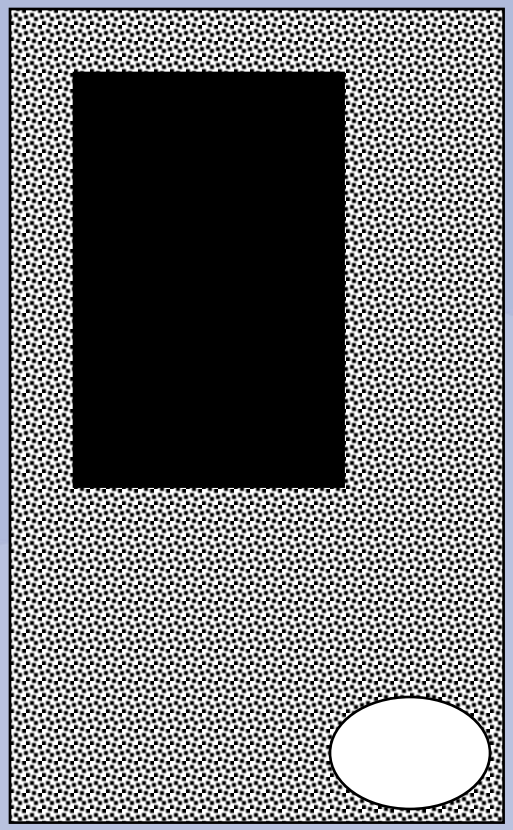
Non-Residential Fees

- **EVERY property owner that discharges to the stormwater and flood control system:**
  - Homeowners
  - Businesses
  - Churches
  - Non-profits
  - Local, state and federal government
- **Non-residential properties pay based on number of ERUs rounded up to next whole number (ERU = 3200 sq ft of IA)**

Non-Residential Fees



= 1 ERU
= $4.98

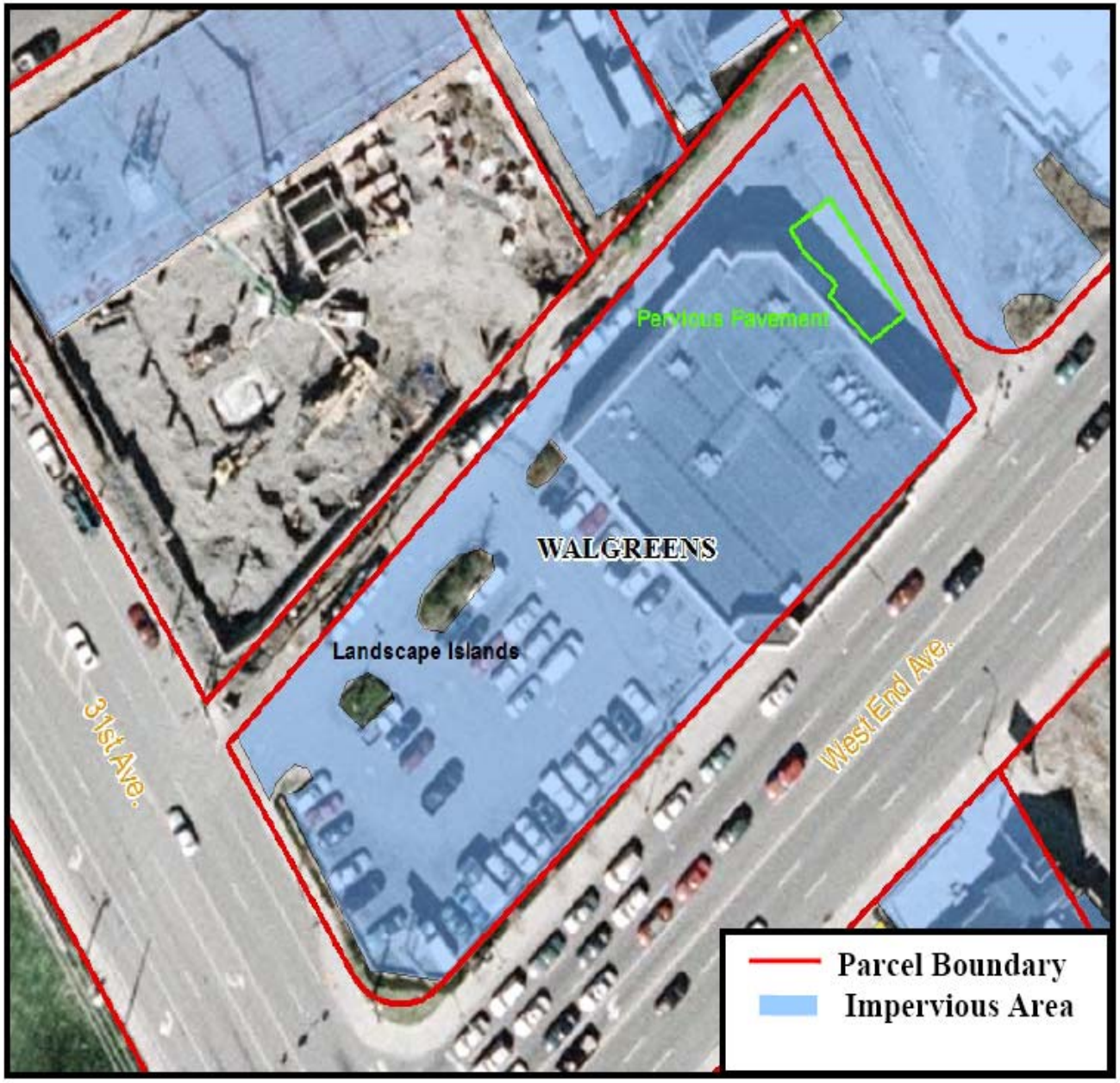


= 15 ERUs
= $4.98 x 15
= $74.70 (minus credits)

Credits

- **Credits are reductions in fees given for:**
  - Reduce the use of the public stormwater system
  - Reduce Metro's cost of service
- **Credit of up to 80% available**
- **Types and amounts of credits :**

1. Detention Credit = up to 40%
2. Stormwater Quality Credit = up to 20%
3. Individual NPDES Permit Credit = 20%
4. Stormwater Education Credit = up to 50%
5. LID Residential Credit = 20%
6. Large Privately Maintained Properties = 60%
7. Total Capture Credit = 80%



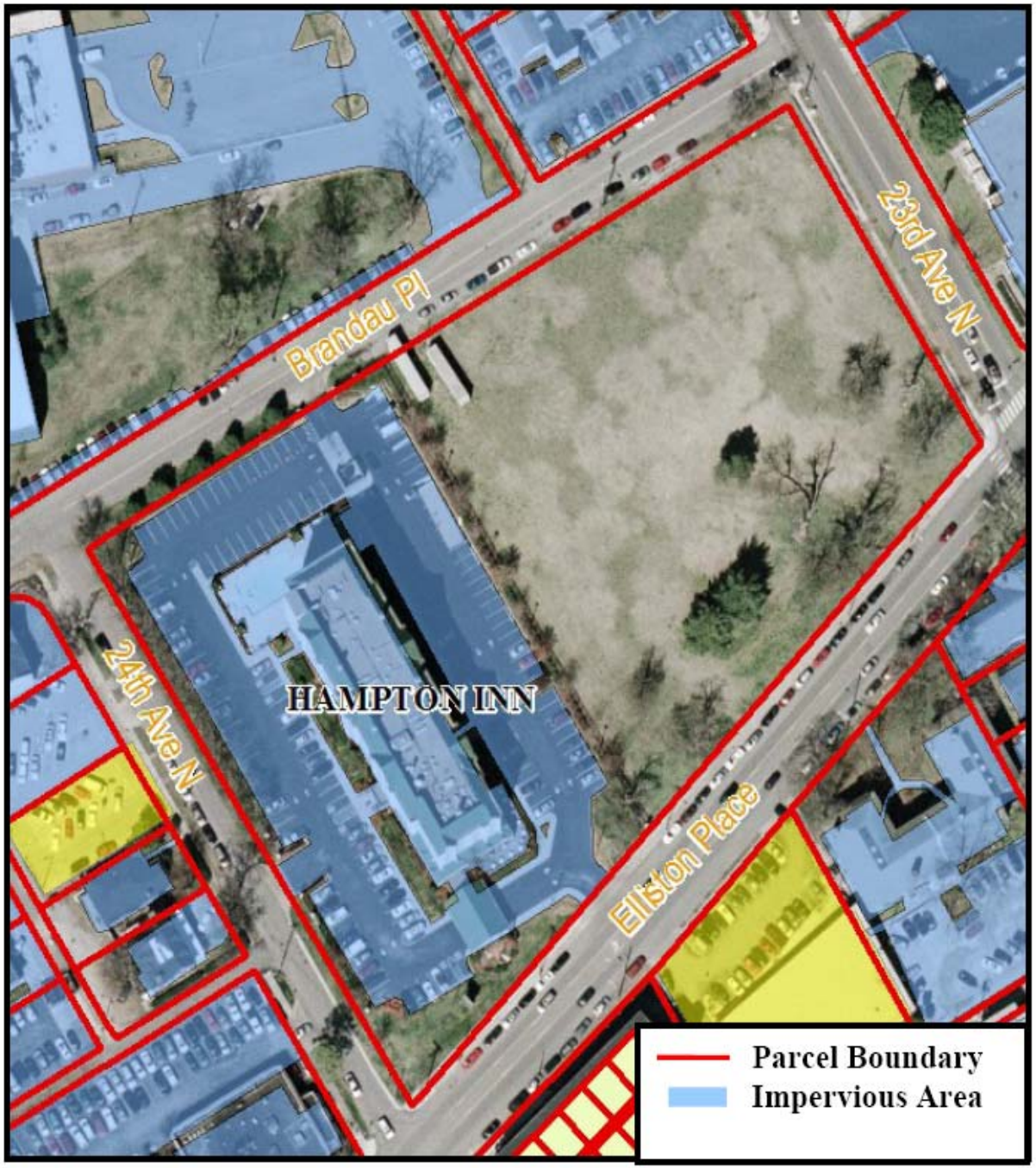
Walgreen's

Total Area = 35,374 sq ft
Impervious Area (excluding pervious pavement) = 32,659 sq ft

ERUs = 32,659/3,200 = 11
Rate = $4.98 per ERU

Monthly Fee = $54.78

Possible Credits
Detention Credit = up to 40%
Water Quality Credit = up to 20%
Monthly Fee w/ Max Credit = $21.91



Hampton Inn

Total Area = 220,754 sq ft
Impervious Area = 78,339 sq ft

ERUs = 78,339/3,200 = 25
Rate = $4.98 per ERU

Monthly Fee = $124.50

Possible Credits
Detention Credit = up to 40%
Water Quality Credit = up to 20%
Monthly Fee w/ Max Credit = $49.80

6025 Nolensville Pike

Total Area = 49,646 sq ft
Impervious Area = 30,748 sq ft

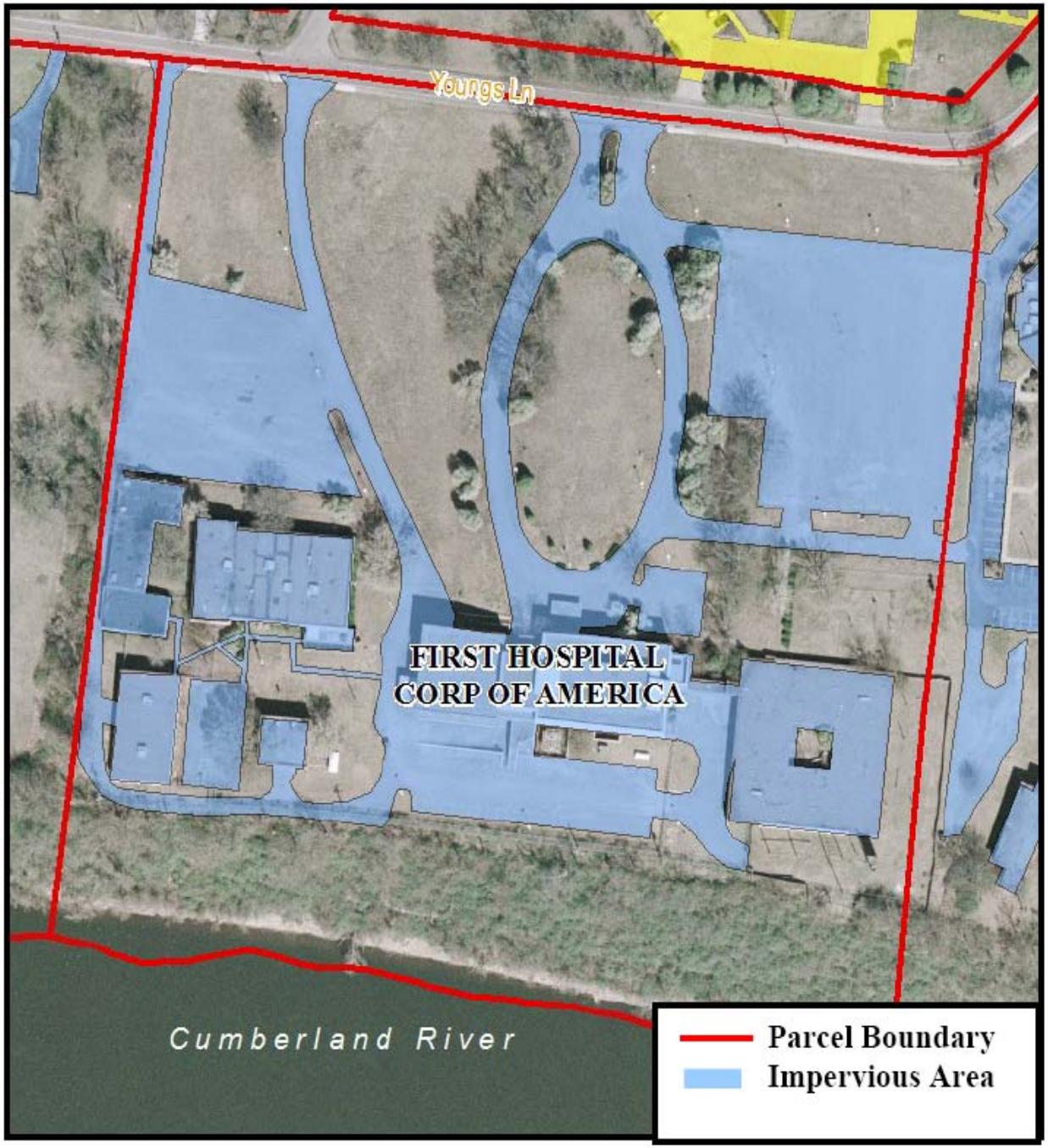
ERUs = 30,748/3,200 = 10
Rate = $4.98 per ERU

Monthly Fee = $49.80

Detention Credit = 40%
Water Quality Credit = 20%
Total Credit = 60%

Monthly Fee w/Credits = $19.92

Heated Space = 5000 sq ft
Cost per heated sq ft = $0.048 per year



First Hospital Corp of America

Total Area = 670,769 sq ft
Impervious Area = 272,330 sq ft

ERUs = 272,330/3,200 = 86
Rate = $4.98 per ERU

Monthly Fee = $428.28

Possible Credits
Detention Credit = up to 40%
Water Quality Credit = up to 20%
Monthly Fee w/ Max Credit = $171.31

Others With User Fees

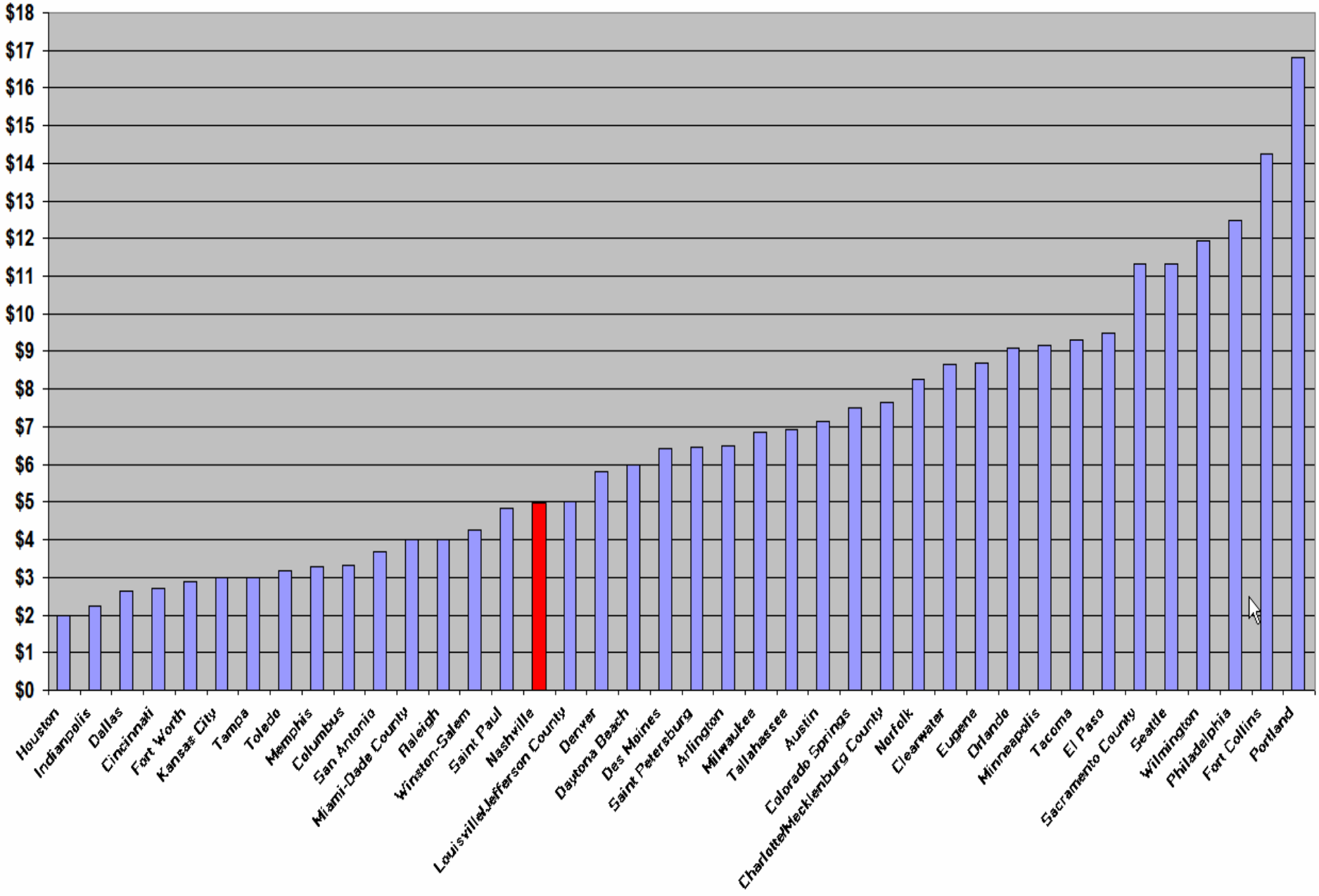
Sister Cities

- Indianapolis
- Dallas
- Cincinnatti
- Kansas City
- Raleigh
- Denver
- Austin
- Tallahassee
- Philadelphia
- Orlando
- Seattle
- Portland

Tennessee Cities

- Chattanooga
- Dyersburg
- Franklin
- Hamilton County
- La Vergne
- Maryville
- Memphis
- Millington
- Murfreesboro
- Red Bank
- Signal Mountain

Monthly Fee per ERU



Questions?